

# MONTHLY WEATHER REVIEW,

## APRIL, 1875.

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WAR DEPARTMENT,

Office of the Chief Signal Officer,

DIVISION OF

TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE AND AGRICULTURE

### INTRODUCTORY.

The present weather review expresses the main features of the April meteorology, as deduced from the following reports and records :

Reports from 88 Stations of the United States Signal Service.

Reports from 10 Stations of the Canadian Meteorological Service.

Reports from 267 Volunteer Observers.

Reports from 1 United States Naval Hospital.

Reports from 27 United States Army Surgeons.

Records furnished by Private Observers, Marine Logs and the Press.

The most noteworthy peculiarities of the weather are as follows : (1) The extraordinary and almost universal continuation of the cold weather. (2) The frequency, lateness and destructiveness of the April frosts. (3) The lateness of the rivers and lakes in opening to navigation. (4) The unusually high range of the barometer. (5) The unusually large quantities of drift-ice and enormous icebergs off the Atlantic coasts.

### ATMOSPHERIC PRESSURE.

The graphic Chart No. II shows the average atmospheric pressure by the isobaric lines in *black*. The monthly phenomena of pressure, as indicated by the barometer, are grouped below under the heads of *Areas of High Barometer* and *Areas of Low Barometer*.

(1) *Areas of High Barometer*.—Of these, eight are noteworthy, as intimately connected with the controlling features of the month's meteorology. Some of these high barometers reached the figures 30.50 inches, and they were attended by severe cold, killing frosts and snow. They have served to make the average barometric range for April higher than the normal range, or that which is the mean of many years' observations. The following details give the time, progress and effects of the different high barometers :

*First*. A high barometer prevailed over the larger portion of the Gulf States during the first three days of April, being central on the 3d in southeastern Louisiana. It was attended by low temperature on the 1st and 2d, and by heavy rain on the 1st.

*Second.* On the 4th, another area of high pressure appeared in the Northwest and Upper Lake region, and moved southeastwardly over the Lower Lakes, the upper Ohio valley and the Middle and Eastern States, which last section it reached on the afternoon of the 5th. Its progress was marked by a decided reduction of temperature and northerly winds. This area, after spreading over all the Atlantic States on the 5th, remained nearly stationary till the afternoon of the 6th. It was then augmented by a

*Third* area of high pressure, which descended from beyond the St. Lawrence valley, with low temperature, northeasterly winds and occasional snow in New England. This area culminated off the Middle Atlantic coast on the night of the 7th.

*Fourth.* During the afternoon of the 11th, a decided rise of the barometer was reported from the Northwest, and a belt of high pressure rapidly developed west of the Mississippi, but soon disappeared except in Texas, where, in diminished intensity and extent, it continued till the 14th.

*Fifth.* An extensive area of very high barometer advanced, on the evening of the 15th, from Dakota and Montana, southeastwardly, along the Missouri valley, and, very quickly, the pressure rose everywhere west of the Mississippi river, with very cold, frost-bearing winds. This area of high barometer was one of the important features of the April weather. On the 16th, it had overrun the whole Mississippi valley and diffused its freezing temperatures as far south as Tennessee and Arkansas. On the 17th, it was accompanied by snow in the Ohio valley and Lake region, and its chilly influences were further disastrously felt on the morning of the 18th from North Carolina and Tennessee to the Lakes and New England. The injury to vegetation was very great during the 17th and 18th.

*Sixth.* On the 20th, another area of this character covered the Upper Lakes, and, thence, progressed southwardly over the Lower Lakes, the Ohio valley and the Alleghany Mountain region. But its effects were not felt so disastrously as those of its predecessor.

*Seventh and Eighth.* Areas of decidedly high pressure were formed in the Northwest on the 23d, and over the Lake region on the 26th.

(2) *Areas of Low Barometer.* Several of these depressions, especially from the 18th to the 26th, were vague, ill-defined, and irregular in their movement. Two or three of a feeble character are not capable of being charted. Ten of the most definite and decided depressions will be found on Chart No. I. Of this number, No. X is probably the most marked and important storm of the month, while No. VII is distinguished as little more than a local disturbance. A small storm-centre, attended with rain and snow, passed over Wisconsin, northeastwardly, on the 1st. But the first important storm, here designated as

No. I, appears well developed, with barometric reading 29.33, on the afternoon of the 2d of April, then central in western Dakota. It traversed only the further Northwest and the Upper Lake region, and was lost to view on the night of the 3d, north of Lake Huron. It was attended, however, with heavy snows over a belt running east and west, about 400 miles broad and 1,000 miles long, from Dakota to Lake Huron.

No. II made its first distinct appearance in the Southwest on the morning of the 4th, and its track lay nearly due northeastward through Kansas, Nebraska, Iowa and Wisconsin, passing beyond the latter State on the 6th. It occasioned a high temperature in the Mississippi valley on the 4th and 5th, and high northeast winds on Lake Superior

during the afternoon of the 5th, but the precipitation accompanying it was light. The barometer-gradients in this depression were also generally light.

No. III pursued very nearly the same track as its predecessor, except that it made a slight detour to the northwestward, after having moved from the Southwest into northern Iowa. Occupying from the afternoon of the 6th till the midnight of the 8th in reaching Lake Superior, it lingered for twenty-four hours a little north of that lake, and then passed off toward Hudson's Bay. During the midnight of the 6th, sleet and very heavy rain preceded this low barometer-area in the central Missouri valley, and the next morning the rain-area progressed in front of it from Nebraska to Wisconsin and Minnesota. The heavy rain-fall along the Missouri and its tributaries was subsequently felt in the rise of that river, reported from the 9th to the 12th of April; it was also perceptible in the increased volume of the Upper Mississippi, as reported on the 9th and 10th. Cold and high northwest winds, with sleet and snow, followed in its rear, as this depression disappeared to the northward.

No. IV also had a southwestern origin in Texas on the 10th, but it moved over more southerly parallels, in a path almost due northeast from Texas to Connecticut, trending a little north into the Ohio valley. It was attended with considerable rain-fall in the Ohio valley and Tennessee, and with frequent but light rains in the Middle States. High easterly winds and heavy snows preceded its approach in New York and New England on the 13th.

When in the upper Ohio valley, this depression was but ill-distinguished from an extensive area of low barometer then (on the 12th) covering the entire country from Illinois and Lake Michigan to Pennsylvania, Virginia and the Carolinas. During this day, three smaller depressions were visible within the great area of low barometer—one in Illinois, one in East Tennessee, and one in Pennsylvania. By 7:35, A. M., of the 13th, there were only two of these left, one in Pennsylvania and that previously in East Tennessee, now advanced to the Virginia and Delaware sea-coasts. These remained nearly stationary till the evening of the 13th, and, at midnight of that day, are seen on the weather-map as a single depression, central off Long Island. The Pennsylvania branch, the original nucleus, remained stationary in the vicinity of Pittsburgh nearly twenty-four hours.

No. V was a Lake-depression, emerging on the night of the 14th from Northern Minnesota and passing along the central line of the Lake system to the lower St. Lawrence valley, where it vanished on the 16th. It was marked by high and dangerous winds on the Lakes, and by considerable precipitation, and was followed by very low temperatures, e. g., 13° F., 14° F., 4° F., 10° F. and 6° F., in the Northwest and Upper Lake region, the temperatures ranging from 12° to 20° F. in the Lower Lake region. This intense cold was sufficient to restore for the time the rigorous conditions of winter, and milder weather did not intervene over the Lakes till the close of the 18th.

No. VI. A marine-storm, moving along the Atlantic coast on the 16th and 17th, approached Cape Hatteras apparently from the West Indies, and occasioned high and dangerous winds from that Cape to Cape May—the wind-velocity at Kittyhawk reaching forty-six miles per hour, with a heavy ocean-swell from the east. This gale was experienced by vessels off Cape Hatteras on the 17th and 18th, the gale commencing at S.W. and backing round to N. and N.N.W., with great fury, causing a heavy cross-sea, and lasting fifty-one hours. On the 19th, the S.W. wind following rose to 62 miles per hour at Kittyhawk. One vessel reports being “surrounded by whirlwinds and waterspouts, culminating in a violent gale from N.N.W., with blinding snow, so

dense that one could scarcely see the distance of three lengths of the vessel." This violent snow-storm at sea, connected with Storm-centre No. VI., is traced by other marine reports 70 miles south of Cape Henry on the 16th, 17th and 18th.

No. VII was of short duration and extent, so far as it is in the power of the office to trace it. Being, also, a feeble depression, the deficiency of pressure was restored on the night of the 19th, and the phenomenon disappears within the field of weather-observations. Its track does not appear to be more than 400 miles long.

No. VIII. This was at first a feeble disturbance, manifested in southern Louisiana, thence slowly moving northeastward to central Alabama; thence, yet more slowly, changing its course to southeast, and passing over western and northern Florida, reaching the Gulf stream, by very tardy advances, on the afternoon of the 23d near Fernandina; after which, its progress was steadily and rapidly maintained along the western margin of the great ocean-current, until, on the 25th, it vanished in the direction of Newfoundland. On Saturday afternoon, while this storm-centre was passing off Cape Henry, vessels on the Chesapeake Bay experienced one of the most severe hurricanes of the winter. The progressive velocity of the gale when off the coast exceeded at times 35 miles per hour, while its cyclonic winds occasionally reached 40 miles an hour. The rain on the seaboard, however, was not very heavy, as the centre kept well out to sea.

No. IX, commencing in the Southwest on the 26th, passed over Tennessee, North Carolina and Virginia, and was attended with heavy rains along its pathway. Otherwise it was not worthy of special note.

No. X. This was, perhaps, the most noteworthy storm of the month. Its course lay due northeast from Indian Territory to the St. Lawrence valley. Its progress was very rapid, occasionally attaining or exceeding a velocity of 42 miles per hour after crossing the Mississippi river; and the cyclonic winds on the Lakes were reported as high as 60 miles an hour. The barometric gradients there were steep, and the barometer fell on Lake Erie to 29.24 inches and, probably, lower. It was accompanied by considerable, but not very heavy or protracted, rains and snows. Winds of from 40 to 50 miles velocity per hour were frequent on Lake Erie. At Erie, Pa., buildings were unroofed and local damage was reported. Thunder and zigzag lightning followed in the rear of the storm after its passage of Lake Erie.

## ATMOSPHERIC TEMPERATURE.

The collective observations of the month's temperature appear on Chart No. II, graphically by the isothermal lines in red, and more accurately by the table in the lower left-hand corner.

(1) *General range.* It is a most remarkable fact, as numerically shown by the table on Chart II, that, in every district of the United States east of the Rocky Mountains, the April temperature has been extraordinarily low. This unusual cold is most noticeable in the Middle and South Atlantic States, New England, the Lower Lake region and the Upper Mississippi valley. The only exception to this abnormal distribution of temperature is on the Pacific coast, where the range is  $2^{\circ}.6'$  above the average of many years. The temperature for the whole northern frontier, from Maine to Dakota, very nearly averages that of freezing to the end of April. The isotherms in the country